

## 5.0 CONCLUSIONS

### 5.1 FORMER EXCAVATIONS

The first objective of this SI was to evaluate whether contaminated soil remains at locations on the former NPD laboratory site where soil removal activities were conducted previously. Concentrations of chemicals detected in soil during this investigation at the former drainage ditch and dry well excavation locations do not exceed applicable screening values. Elevated concentrations of SVOCs and lesser concentrations of VOCs and diesel-range and heavy-oil-range petroleum hydrocarbons appear to remain in soil directly beneath the former fuel oil tank location. Of these compounds, only one PAH (benzo[a]pyrene) was identified in the human health risk evaluation as a COPC. This compound was detected at concentrations approximately five times the industrial soil PRG. It is possible that this elevated concentration is related to asphalt fragments present in the sample. Confirmation samples collected during tank removal activities indicated that contamination does not exist in soil surrounding the former tank location (USACE 1998); thus the affected soil is limited in extent. Because soil surrounding the former tank vault is expected to remain covered by asphalt pavement, exposure is limited and therefore the soil with benzo(a)pyrene is not expected to pose a potential health risk. Given the fate and transport characteristics of benzo(a)pyrene, as well as the paved ground surface, this chemical is not expected to be mobile in the soil or infiltrate to groundwater. Analytical results of groundwater samples collected in downgradient and crossgradient monitoring wells indicate that groundwater is not impacted by the former tank.

Based on the results of this SI, soil removal activities conducted previously at the dry well, drainage ditch, and fuel oil tank vault effectively removed a sufficient amount of contaminated soil to eliminate risk to human health or the environment. The concentrations detected at former excavation locations are assumed to represent maximum values of the remaining contaminants because the sources have been removed and concentrations will decrease with time through natural attenuation. Further removal actions or assessment are not warranted in these areas.

### 5.2 PAST LABORATORY ACTIVITIES

The second objective of this SI was to assess whether other past laboratory activities and the use of the landfill have adversely impacted soil or groundwater quality beneath the site. No contaminants were detected in the background, transformer pad, or building cleanout pipe soil samples at concentrations that exceed the applicable PRGs. Arsenic, benzo(a)pyrene, and 1,2-dibromoethane were detected in landfill soil samples at concentrations that exceed the respective PRGs. Concentrations of arsenic, chromium, and Aroclor® 1242 in the sump sediment sample and arsenic in the representative concrete drum sample also exceed respective screening values.

However, drums containing solidified concrete that were encountered in the landfill during this SI, landfill material excavated from trench TR-5, sediment from the concrete sump, and the top 3 inches of topsoil inside and around the fence surrounding the former transformer pad were removed from the site and transported offsite for proper disposal. The remaining landfill waste material and affected soil are scheduled to be removed in the summer of this year.

Concentrations of total and dissolved arsenic and carbon tetrachloride detected in groundwater samples exceed screening levels. However, the exposure pathway for constituents in groundwater is incomplete, and the detection of carbon tetrachloride was isolated to one sample and only slightly exceeded the screening values. Monitoring wells and microwells were located such that, regardless of the flow direction, contamination impacts sufficient to be of concern would have been detected throughout the groundwater sampling system. Also, based on the size of the site, the number of groundwater sampling points in this investigation was adequate to capture potential contamination that would be of concern.

The results of this SI indicate that past activities at the former laboratory facility have not adversely affected site soil or groundwater quality beyond the areas previously or planned for cleanup. Upon completion of the planned landfill cleanup, remaining concentrations of detected constituents do not pose a human health or ecological risk, as summarized in Section 5.3. Based on analytical results and field observations, additional investigation or data collection with respect to past laboratory activities at the site is not warranted.

### **5.3 POSSIBLE HUMAN HEALTH AND ECOLOGICAL RISKS**

A conceptual site model was developed and a human health risk evaluation and ecological risk assessment were performed to achieve the third objective of this investigation: to evaluate whether contamination that may pose a risk to human health or the environment is present at the site. The conceptual site model incorporated site geologic and hydrogeologic information, analytical results and comparison to screening values, a beneficial water use determination and a future land use assessment, chemical fate and transport properties, and site conditions. An ecological risk assessment and a human health risk evaluation were performed using standard ODEQ and EPA methodology. The human health risk evaluation assumed that the landfill will be removed as planned.

The results of an ODEQ Level I (scoping) ERA concluded that neither soil nor groundwater at the site would be a source of contaminant exposure to ecological habitats or species; therefore, Level II (screening) ERA is not warranted.

Based on results from a human health risk evaluation, five COPCs in soil were identified: Aroclor® 1254, arsenic, benzo(a)pyrene, benzo(a)anthracene, and benzo(b)fluoranthene. The

evaluation concluded that site-specific screening levels are not warranted and that the EPA Region 9 industrial soil PRGs are sufficiently protective of site exposures for the five COPCs in soil. As presented in Table 4-11, concentrations for only two of the five compounds (benzo[a]pyrene and arsenic) in landfill soil and one compound (benzo[a]pyrene) in the fuel oil tank vault soil exceed the PRGs. The remaining landfill waste material is scheduled to be removed in the summer of this year, thereby eliminating potential associated human health or ecological risks. Based on the intended future land use of the site, the depth of soil containing benzo(a)pyrene, and pavement on the ground surface, soil surrounding the former tank removal excavation does not pose a potential risk to human health or the environment. Furthermore, benzo(a)pyrene is not expected to be present in or migrate to groundwater at concentrations that would exceed groundwater screening values.

The conceptual site model clearly indicates that after landfill removal actions are complete, the limited amount of contamination that will remain on site will not pose a risk to human health or the environment. With the planned removal of the landfill material, no data gaps are identified at this time. The site has been adequately characterized, and the level of data evaluation conducted and the results obtained during this site investigation are sufficient to support a 'No Further Action' determination. Therefore, further characterization of this site is not warranted.